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EXAMINER

DANIELS, MATTHEW J

ART UNIT	PAPER NUMBER
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1732

DATE MAILED: 02/24/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

DETAILED ACTION

1. In the claims:

Claims 1-3,5,9-15,20,23-25,27,29,30 and 33-48 are pending

Claims 1, 5, 12, 13, 14, 15, 23, 24, 25, 27, and 29 are currently amended.

Claims 35-48 are withdrawn.

Drawings

2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the “matched mold halves” must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

3. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New Sheet” pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will

Art Unit: 1732

be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. **Claims 23-25, 27, and 29** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The laminate of Claim 1 is formed “consisting” of particular parts. Claims 23-25, 27, and 29 add foam or insulation, or other components, which do not fall within the scope of “consisting” the claimed parts. No additional parts can be added to a component “consisting” of the specified laminates.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. **Claims 1, 5, 9-12, 20** are rejected under 35 U.S.C. 103(a) as being unpatentable over Holtrop (USPN 4,529,641) in view of Byma (USPN 6,322,658 B1), Breezer (USPN 5,635,129), Steward (USPN 4,211,590), and Haardt (USPN 5,180,628). **As to Claim 1**, Holtrop teaches a thermoforming process for forming headliners (5:24) comprising the steps of:

Art Unit: 1732

transferring a sheet to a thermoforming mold which would have obviously had matched mold halves (4:16-24)

transferring a cover stock material to the thermoforming mold (4:17)

compressing and fusing the sheet and cover stock to form a compression molded first headliner part (4:16-24).

transferring the compression molded first part to a second mold and positioning in half of a vacuum thermoforming mold (4:51-5:28).

transferring the second sheet onto an opposing half mold of the vacuum thermoforming mold, vacuum molding the second sheet forming a vacuum molded second headliner part (4:51-5:28).

compressing the half molds of the thermoforming mold fusing regions of the compression molded covered headliner part to the second headliner part (4:64-68).

forming a covered unified part consisting of the compression molded covered first headliner part and a vacuum molded second headliner art, where the covered unified part has at least one interior compartment, which would have obviously had head impact cushioning.

Holtrop appears to be silent to:

a) an oven for heating the first and second sheets to predetermined temperatures, b) frames holding the first and second sheets, c) “matched” mold halves, d) thermoforming the second sheet onto half molds prior to fusing regions of the headliner parts, e) the interior compartment having impact cushioning, f) ejecting the unified part.

However, these aspects would have been prima facie obvious for the following reasons:

Art Unit: 1732

- a) Byma teaches an oven (3:66) for heating a first and second sheet to predetermined temperatures (Fig. 4) for thermoforming headliner parts to obtain optimal compression and bonding of the layers (2:1-4).
- b) Steward teaches (6:40-49) use of tenter frames during a preheating step prior to thermoforming a headliner to avoid shrinkage and surface irregularities.
- c) The Examiner submits that Holtrop teaches lamination, and it would have been prima facie obvious to provide flat plates, which would be “matched” to cause Holtrop’s lamination (4:16-24).
- d) Breezer teaches a thermoform process comprising holding a second sheet along its edges (Fig. 6, Item 30); heating the second sheet (3:49); transferring and molding the second sheet onto an opposing half mold of the vacuum thermoforming mold forming a second part (3:48-50); and then compressing the half molds of the thermoforming mold fusing regions of the first part to the second part (3:50-54), thereby forming a unified part having at least one interior compartment (Fig. 6).
- e) The Examiner submits that Holtrop’s interior compartment would have obviously had impact cushioning.
- f) Haardt teaches ejecting a composite laminate part (4:55-56).

One would have been motivated to combine the methods taught by Byma, Steward, Breezer, and Haardt, with the twin-sheet thermoforming process taught by Holtrop in order to produce a headliner with improved acoustic properties as taught by Holtrop, optimal bonding of the laminate layers as taught by Byma, without shrinkage and surface irregularities as taught by

Art Unit: 1732

Steward, with increased thickness as taught by Breezer, and reduced danger to the laborer by ejecting the part rather than removing it manually as in the method of Haardt.

As to Claim 5, Holtrop teaches a second headliner part that is further comprised of a layer of fusing adhesive (3:59-61 and 4:16-20 and 4:33-35). **As to Claim 9**, Holtrop teaches a cloth (3:62) and a fabric (4:17) cover stock material, which the Examiner interprets to be the same as a felt. **As to Claim 10**, Holtrop teaches a cover stock with an underlying layer of foam (4:17-18). **As to Claim 11**, Holtrop further teaches an interlayer adhesive (3:59-63 and 4:16-24) to promote the adhesion of the fabric and foamed thermoplastic sheet. **As to Claim 12**, Holtrop teaches (4:33-50) adhesives on the inner surfaces of headliner parts and fusing by thermoforming to produce an adhesively laminated covered unified part (4:16-66). **As to Claim 20**, Holtrop teaches a headliner (5:24). **As to Claims 23 and 24**, Holtrop teaches the compression forming of the laminates, Breezer teaches the vacuum molding, and Holtrop also teaches injecting foam, which would have obviously acted as insulation (5:15-21). **As to Claims 25 and 27**, both of Holtrop's laminates are compression molded and have a scrim (4:16-32). Breezer teaches vacuum forming prior to adhering the two laminates. Holtrop also teaches injecting foam, which would have obviously acted as insulation (5:15-21). **As to Claim 29**, Holtrop's foam would have obviously enhanced the acoustics of the headliner (5:15-28). **As to Claims 33 and 34**, Steward teaches (6:40-49) use of tenter frames during a preheating step prior to thermoforming a headliner to avoid shrinkage and surface irregularities, and Byma teaches an oven (3:66) for heating a first and second sheet to predetermined temperatures (Fig. 4) for thermoforming headliner parts to obtain optimal compression and bonding of the layers (2:1-4). Providing these treatments to both sheets would have been prima facie obvious.

6. **Claims 2 and 3** are rejected under 35 U.S.C. 103(a) as being unpatentable over Holtrop (USPN 4,529,641) in view of Byma (USPN 6,322,658 B1), Breezer (USPN 5,635,129), Steward (USPN 4,211,590), Haardt (USPN 5,180,628), and further in view of van Damme et al (Reinforced Plastics, July/August 1999, pages 48-50). Holtrop, Byma, Breezer, Steward, and Haardt teach the subject matter of Claim 1 above under 35 USC 103(a). **As to Claims 2 and 3**, Holtrop and the other cited references appear to be silent to the claimed laminates. However, the Examiner submits that this limitation is drawn to an article limitation which does not materially affect the method. However, additionally, Haardt teaches a first sheet (2:23) that is a low pressure (3:47), thermoformable, thermoplastic composite comprised of polypropylene and reinforcing agents (2:38). Haardt teaches both first and second sheets comprised of polypropylene and reinforcing agents (2:35-39), and long glass fibers (2:59 to 3:6) used as reinforcing agent in the second sheet (3:3), and therefore it would have been obvious to one of ordinary skill that long glass fibers also be used as the reinforcement in the first sheet. Although Haardt is silent to the second sheet that is a “low pressure composite has a flexural modulus of about 900 MPa to about 1800 MPa as determined by ASTM D792,” van Damme teaches a laminate that would have obviously fulfilled the claimed conditions (pages 48-50). It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the method of van Damme into that of Holtrop, Byma, Breezer, Steward, and Haardt because Holtrop teaches that recent efforts are directed at fiberglass (1:39), and van Damme specifically suggests incorporation into headliners (page 50, left column).

Art Unit: 1732

7. **Claims 13-15** are rejected under 35 U.S.C. 103(a) as being unpatentable over Holtrop (USPN 4,529,641) in view of Byma (USPN 6,322,658 B1), Breezer (USPN 5,635,129), Steward (USPN 4,211,590), Haardt (USPN 5,180,628). **As to Claim 1**, Holtrop teaches a thermoforming process for forming headliners (5:24) comprising the steps of:

transferring a sheet to a thermoforming mold which would have obviously had matched mold halves (4:16-24)

transferring a cover stock material to the thermoforming mold (4:17)

compressing and fusing the sheet and cover stock to form a compression molded first headliner part (4:16-24).

transferring a reinforcing scrim to the second sheet, forming a compression molded scrim reinforced second headliner part (2:30-32 and 4:16-32)

compressing and fusing the reinforcing scrim to a thermoforming mold which would have obviously had matched mold halves, forming a compression molded scrim reinforced second headliner part (4:51-68)

transferring and positioning the compression molded scrim reinforced second headliner part to the opposing half mold of the thermoforming mold (4:51-68)

compressing the half molds of the thermoforming mold fusing regions of the compression molded covered first headliner art to the compression molded scrim reinforced second headliner part, forming a reinforced covered, unified part consisting of a compression molded covered first part and a compression molded scrim reinforced second part having at least one interior compartment.

Holtrop appears to be silent to:

Art Unit: 1732

a) an oven for heating the first and second sheets to predetermined temperatures, b) frames holding the first and second sheets, c) “matched” mold halves, d) thermoforming the second sheet onto half molds prior to fusing regions of the headliner parts, e) the interior compartment having impact cushioning, f) ejecting the unified part.

However, these aspects would have been *prima facie* obvious for the following reasons:

- a) Byma teaches an oven (3:66) for heating a first and second sheet to predetermined temperatures (Fig. 4) for thermoforming headliner parts to obtain optimal compression and bonding of the layers (2:1-4).
- b) Steward teaches (6:40-49) use of tenter frames during a preheating step prior to thermoforming a headliner to avoid shrinkage and surface irregularities.
- c) The Examiner submits that Holtrop teaches lamination, and it would have been *prima facie* obvious to provide flat plates, which would be “matched” to cause Holtrop’s lamination (4:16-24).
- d) Breezer teaches a thermoform process comprising holding a second sheet along its edges (Fig. 6, Item 30); heating the second sheet (3:49); transferring and molding the second sheet onto an opposing half mold of the vacuum thermoforming mold forming a second part (3:48-50); and then compressing the half molds of the thermoforming mold fusing regions of the first part to the second part (3:50-54), thereby forming a unified part having at least one interior compartment (Fig. 6).
- e) The Examiner submits that Holtrop’s interior compartment would have obviously had impact cushioning.
- f) Haardt teaches ejecting a composite laminate part (4:55-56).

One would have been motivated to combine the methods taught by Byma, Steward, Breezer, and Haardt, with the twin-sheet thermoforming process taught by Holtrop in order to produce a headliner with improved acoustic properties as taught by Holtrop, optimal bonding of the laminate layers as taught by Byma, without shrinkage and surface irregularities as taught by Steward, with increased thickness as taught by Breezer, and reduced danger to the laborer by ejecting the part rather than removing it manually as in the method of Haardt. **As to Claim 14**, Holtrop teaches an underlying layer of foam (4:17-18). **As to Claim 15**, Holtrop teaches (4:33-50) adhesives on the inner surfaces of headliner parts and fusing by thermoforming to produce a covered unified part (4:64-66).

8. **Claim 29** is rejected under 35 U.S.C. 103(a) as being unpatentable over Holtrop (USPN 4,529,641) in view of Byma (USPN 6,322,658 B1), Breezer (USPN 5,635,129), Steward (USPN 4,211,590), Haardt (USPN 5,180,628), and further in view of Strapazzini (USPN 5,529,742). Holtrop, Byma, Breezer, Steward, and Haardt teach the subject matter of Claim 1. As to Claim 29, Strapazzini teaches a vacuum forming (4:28) method for forming plastic molded panels with inserts wherein objects such as wires and duct work (2:14) are molded within the thin plastic sheet blanks. Holtrop teaches covered unified parts (4:1-68). Strapazzini also teaches integral portions configured to receive or mount exterior mechanical parts or trim elements (2:15-18). The Examiner interprets these to be fasteners. It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the elements taught by Strapazzini in the method of Holtrop, Byma, Steward, Breezer, and Haardt in order to provide

Art Unit: 1732

acoustic improvements and to hide items such as wiring and fasteners from view and thereby provide a more pleasing appearance to the headliner.

9. **Claim 30** is rejected under 35 U.S.C. 103(a) as being unpatentable over Holtrop (USPN 4,529,641) in view of Byma (USPN 6,322,658 B1), Breezer (USPN 5,635,129), Steward (USPN 4,211,590), Haardt (USPN 5,180,628), and further in view of Corpe (USPN 5,795,015). **As to Claim 30**, Holtrop is silent to the specific finishing treatments sought by Applicant. Corpe teaches (6:44-49) water jet cutting. It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to include a step of water jet cutting to improve the overall appearance of the headliner, to remove it from the framed sheets, and make it fit into the vehicle. It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the method of Corpe into that of Holtrop, Byma, Steward, Breezer, and Haardt in order to provide improved aesthetic appearance and functionality as in the method of Corpe.

Response to Arguments

10. Applicant's arguments filed 23 November 2005 have been fully considered but they are not persuasive. The arguments appear to be on the following grounds:

a) The compression molded first headliner part is formed by compression molding having matched half molds. This process is in contrast to vacuum molding. Vacuum and compression molding are in contrast to pressure molding, where no vacuum is created, but pressurized air is forced into the mold.

b) Applicant does not first laminate the layers, and then create a three-dimensional shape.

Applicant employs compression molding to form the first part where compression molding imparts the three-dimensional shape to the first sheet. Applicant employs vacuum molding to form a second part. After molding the first and second headliner parts are fused. Holtrop cannot apply pressure until the blocks are closed.

c) Claim 13 is amended to be an independent claim which produces a covered unified part consisting of the compression molded first part and a compression molded scrim reinforced headliner part.

d) The utilization of a glass fiber composite is novel in light of Holtrop and Juriga

e) Claims 33 and 34 claim the use of a pre-heat oven. While Byma teaches an oven, he does not teach a preheat oven prior to the oven.

f) Strappazini does not teach creating a headliner having an interior cavity with wiring, ductwork, and reinforcing components, or acoustic enhancing materials.

g) Corpe does not teach punching, laser, knife trimming, and vibration, ultrasonic, and hot plate welding

11. These arguments are not persuasive for the following reasons:

a) The Examiner submits that the ordinary artisan performing Holtrop's process would have used flat "matched" mold halves to laminate the fabric and substrate using heat and pressure. The claimed matched mold halves, as claimed, are not distinct from two-dimensional flat plates. The method of Holtrop is clearly a "twin-sheet thermoforming" process (5:22-23), and the Examiner

Art Unit: 1732

submits that it is well known in the art to perform a twin-sheet thermoforming process with vacuum only instead of a blow pin.

b) The argument is not commensurate with the scope of the claim, which does not claim the three-dimensional shape. The vacuum forming is common in the art. Breezer teaches that vacuum forming can proceed prior to compression.

c) Holtrop's fabric can be considered a scrim, and in the alternative, van Damme's method clearly suggests Azdel Superlight, which appears to be the scrim disclosed in the Applicant's specification.

d) There is clear suggestion in the art to use Azdel Superlight as a reinforcing scrim in headliners (Van Damme, page 50, left column). This reference is used in the rejection of Claims 2 and 3 under 35 USC 103(a).

e) The ordinary artisan understands that the bonding disclosed by Holtrop requires heating. The Examiner submits that the particular apparatuses do not materially affect the method. There is clear suggestion to heat to provide bonding or shaping in the method of Holtrop.

f) The Applicant's arguments appear to point out an alternate embodiment in Strappazini's method.

g) Claim 30 still appears to include water-jet trimming. However, it is submitted that many finishing operations including punching, laser cutting, and welding, are known and obvious in the art.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew J. Daniels whose telephone number is (571) 272-2450. The examiner can normally be reached on Monday - Friday, 7:30 am - 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Colaianni can be reached on (571) 272-1196. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

MJD 2/20/06



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